EDGE Application Firmware FSE-K20/K21

## For Spectrum Analyzers FSE and Signal Analyzers FSIQ with FSE K10/11

- EDGE capability added to Application Firmware FSE-K10 and FSE-K11
- Standard-conformal EDGE transmitter measurements
- FSE-K20 for mobile phones, enhancement to FSE-K10
- FSE-K21 for base stations, enhancement to FSE-K11
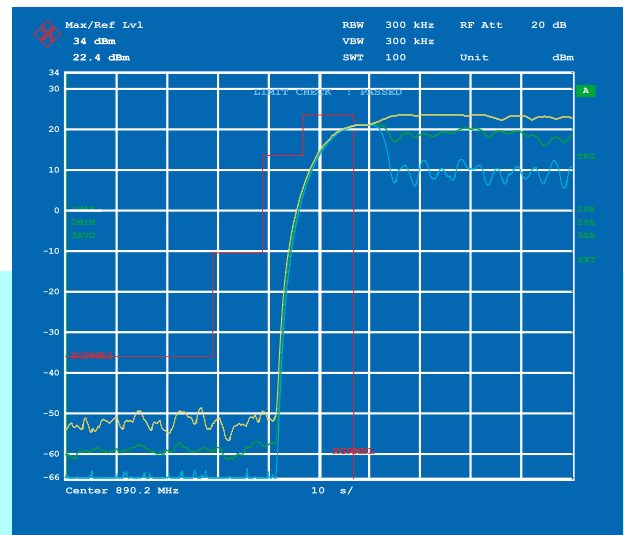
New measurement functions:
- Modulation accuracy measurement including:
    - EVM measurement with ETSI-conformal weighting filter
    - 95:th-percentile measurement
    - Measurement of origin offset suppression
- Limit lines for EDGE conforming to ETSI 05.05
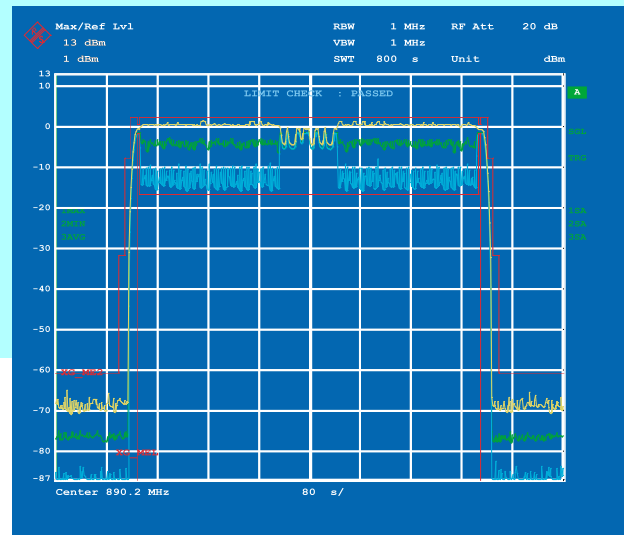
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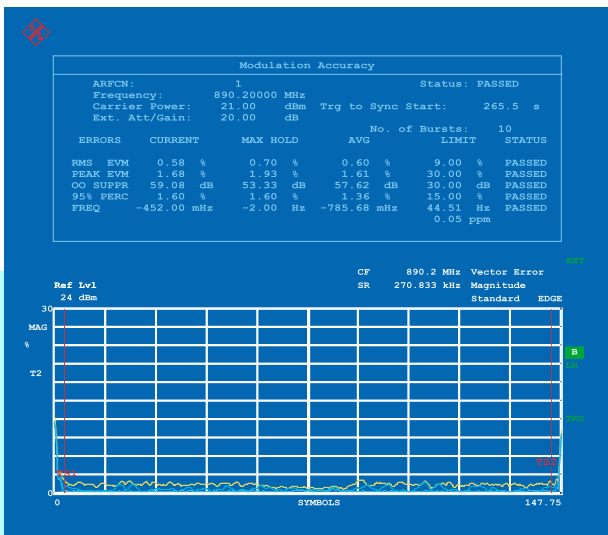
1 EDGE Modulation accuracy with EVM and 95:th percentile Messung
2 Power vs time, rising edge of a burst
3 Power vs time with EDGE Mask

Characteristics

The firmware modules FSE-K20 and FSE-K21 enhance the measurement functions of firmware modules FSE-K10 and FSE-K11 by modulation measurements on $3\pi/8$ shifted 8PSK-modulated signals in line with the EDGE standard.

The convenient and automatic measurement functions of FSE-K10 and FSE-K11 are now also available for measurements on EDGE signals (see also data sheet FSE-K10/K11):

– Mean carrier power
– Power versus time
– Spectrum due to modulation
– Spectrum due to transients
– Spurious emissions

New measurement functions:

– Measurement of modulation quality of an EDGE signal comprising: Error vector magnitude (EVM), peak and RMS
95:th-percentile measurement
Origin offset suppression
– EDGE-specific limit lines and limit values

Fitted with these two firmware modules, FSE and FSIQ are convenient one-box solutions for GSM and EDGE RF transmitter measurements. The wide dynamic range, especially for measuring broadband noise and spurious emissions, simplify test setups. Further application firmware modules for IS-95, 3GPP/WCDMA and universal vector signal analysis make FSE and FSIQ ideal multi-standard test platforms.

Measurement examples

EDGE EVM

The error vector magnitude (EVM) is determined over 200 bursts in line with the standard, the error vector being filtered by a special EDGE lowpass filter.

95:th-percentile measurement

The 95:th-percentile measurement determines the EVM value below which 95% of all EVM values are to be found.
In FSE-K20 and FSE-K21 this measurement is part of the modulation measurement (EVM).

Specifications

The specifications apply to FSE-K20 in conjunction with FSE-K10 and FSE-K21 in conjunction with FSE-K11. They are based on the data sheet specifications of Spectrum Analyzers FSE and Option FSE-B7 as well as Signal Analyzers FSIQ and have not been checked separately. Values given with a tolerance are measurement uncertainties with a confidence level of 95%.

Measurements	FSEA30, FSEB30, FSEM30, FSIQ3, FSIQ7, FSIQ26

Modulation error

EVM, residual (S/N >40 dB)

rms	<0.5%
peak	<2.5%
95:th percentile	<2.5%

Origin offset suppression

Measurement range	−20 dBc to −50 dBc
Frequency error, uncertainty (S/N > 40 dB)	<5 Hz + error of reference frequency

Mean carrier power

Power measurement uncertainty, absolute, FSEx	<0.9 dB
Power measurement uncertainty, relative, FSEx	<0.55 dB
Power measurement uncertainty, absolute, FSIQ or FSEx fitted with FSE-B22	0.6 dB
Power measurement uncertainty, relative, FSIQ or FSEx fitted with FSE-B22	0.3 dB

Power vs time

Reference level uncertainty

FSEx	≤0.9 dB
FSEx mit FSE-B22, FSIQ	≤0.6 dB

Relative reference level uncertainty

FSEx	≤0.3 dB (0 dB to 50 dB below reference level)
	≤0.5 dB (50 dB to 70 dB below reference level)
FSEx mit FSE-B22, FSIQ	≤0.2 dB (0 dB to 70 dB below reference level)
Trigger error	±0.25 µs [±1/16 bit]
Dynamic range (RBW = 300 kHz)	75 dB

Ordering infomation

Application firmware FSE-K20	**FSE-K20**	**1106.4086.02**

for EDGE measurements on mobiles
Prior to installing FSE-K20 the following options must be fitted:

FSEA, FSEB, FSEM, FSEK	Vector Signal Analyzer FSE-B7, Application Firmware FSE-K10
FSIQ3, FSIQ7, FSIQ26, FSIQ40	Application Firmware FSE-K10

Applikations-Firmware FSE-K21	**FSE-K21**	**1106.4186.02**

for EDGE measurements on base stations
Prior to installing FSE-K21 the following options must be fitted:

FSEA, FSEB, FSEM, FSEK	Vector Signal Analyzer FSE-B7, Application Firmware FSE-K11
FSIQ3, FSIQ7, FSIQ26, FSIQ40	Application Firmware FSE-K11

Recommended extras

Increased Level Accuracy[1]	FSE-B22	1106.3480.02
1 dB Attenuator[2]	FSE-B13	1119.6499.02

[1] Only for FSEx, not for FSIQ

[2] Not for FSEM 20/FSEK 20; other FSEx models: factory-installed in conjunction with FSE-B22 only, cannot be retrofitted

Certified Quality System
ISO 9001
DQS REG. NO 1954

Certified Environmental System
ISO 14001
REG. NO 1954

ETSI MEMBER
…making the right connections.

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